Data Analysis System for the Japanese Village Vaccination Reports in 1875

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Smallpox was one of the most terrible causes of mortality in pre-industrial Japan. As there were only few historical documents of death causes, knowledge about smallpox mortality, epidemics, and the changes to infant and child mortality brought forward by the introduction of vaccination is in sufficient. Only recently, we could find the village vaccination reports and started to construct the data analysis system for the reports.

In January 1875, some prefectural governors in the suburbs of Tokyo ordered village heads to submit the village vaccination reports listing children and youth under twenty-five years old, the names of vaccinated and unvaccinated people, as well as those infected smallpox. The village vaccination reports provided the following information: name of the household head, address, name of household members under twenty-five years old, age, date of vaccination, the vaccinator's name and address, date when a smallpox case was diagnosed, the reason why he/she was not vaccinated.

The data analysis system for the village vaccination reports is a new part of DANJURO (http://kawaguchi.tezukayama-u.ac.jp). The system composed of the database of the reports and application programs for outputting demographic indicators. We chose MySQL as the DBMS and PHP as the web open source application program. We have stored up the village vaccination reports of eleven villages in Ashigara-Kami, Ashigara-Shimo, Tsukui and Yurugi counties. The database has three tables: personal medical history table, location of the villages table, and bibliography table. With application programs, user can obtain a graph of the corresponding indicator including the number of persons who survived from smallpox, the population pyramid of persons who contracted smallpox, the date of initial and second vaccination, the population pyramid of children who had received initial and second vaccination, etc.

DANJURO demonstrates that smallpox was still endemic and epidemics occurred about every five years in this area until 1875. We also estimate the annual smallpox mortality was 379-478 per 100,000 in Ashigara-Kami from 1851 to 1875.